	City Of Maricopa Engineering Guidelines	

Standard Plan Notes

These Construction Notes are the base notes that are required by the City of Maricopa on all civil construction drawings submitted for review.

Please insure that all applicable notes for each phase of construction are included, if within the scope of work for your project. These are "minimum base notes' and may be supplemented as your project may require.

This document, "Maricopa Standard Plan Notes" (MSPN), is available in hard copy at the Engineering Department and also in Acrobat PDF and other electronic formats. It can be sent to you via e-mail if you provide us with your e-mail address. In the near future you will be able to download these notes directly from the Engineering Department's Web Site.

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I. GENERAL NOTES: CONSTRUCTION INSPECTION AND TESTING

1. All public improvement construction within the public right-of-way and onsite shall be conducted in accordance with, and conform to, the latest edition of the Uniform Standard Specifications for Public Works Construction and Uniform Standard Details for Public Works Construction, both as published by the Maricopa Association of Governments (M.A.G.).

2. Inspection of work per M.A.G. 105.10: The Engineer shall be permitted to inspect all materials, and each part or detail of the work at any time for the purpose of expediting and facilitating the progress of work. He shall be furnished with such information and assistance by the contractor, as is required to make a complete and detailed inspection. The City Engineer requires that the actual test result data sheet accompany all compaction test results submitted to the City's inspector. Pass/Fail statements are not acceptable without the attached data sheet. Failure to submit the test result data sheets will result in an incomplete submittal and the test will be rejected.

3. In the event of conflict between M.A.G. Standard Specifications and Standard Details and these plans, these plans shall prevail.

4. The office of the City Engineer shall be notified at least forty-eight (48) hours prior to the commencement of any work within the City right-of-way. **TELEPHONE: 520-568-9098**.

5. Contractor is to notify all public utilities at least two (2) working days prior to construction, for field locations of their respective facilities, by contacting the following: **BLUE STAKE - 1-800-782-5348.**

6. Contractor shall coordinate and make arrangements for relocation of any utilities conflicting with the proposed construction of these plans, with the appropriate utility.

7. Removal and replacement of all trees, shrubs, vegetation, miscellaneous structures, debris, rubble and other deleterious materials within the limits of construction shall be at the contractor's expense.

8. All concrete sidewalks, driveways, aprons, cross-pans, valley gutter, curbs and gutters landscaping and irrigation that may be damaged during the course of constructions shall be removed and replaced by the contractor at the contractor's expense.

9. Shoring is to be installed or a trench box is to be used, in all trenches in excess of five (5') feet in depth. A registered civil engineer or soils

engineer shall certify shoring installation plans, details and specifications. Shoring must conform to OSHA 29 CFR, Part 1926, and Subpart D.

10. Compaction testing is required and must be performed in the presence of a representative of the City Engineer.

    BACKFILL: Backfill within the public utility easements and within public street right-of-way compact to 95% of maximum theoretical density per ASTM D698. All materials outside the moisture limit shall be considered unsuitable, and subject to removal. No hydraulic compaction or water jet compaction will be allowed. All compaction must be done by mechanical means. Moisture limit spec: 2.0 percent below optimum moisture, material shall be uniform.

    SUB-GRADE: Sub-grade preparation for all new streets and roadways shall consist of scarifying and loosening sub-grade to a depth of six (6") inches. Sub-grade shall be constructed to achieve uniform moisture content by the addition of water and compacted to 95% of maximum density. Moisture shall be maintained between optimum and 4.0% below optimum moisture and shall be compacted to 95% on maximum theoretical density, as determined by ASTM D698. All materials outside the moisture limit at the time of placement and compaction shall be considered unsuitable and subject to removal. The finished surface of the sub-grade shall not vary from the grades established by the City Engineer by more than: 0.04 of a foot above or below specified grade

11. Install four (4") inches of aggregate base course material, compacted to 100% under all sidewalks, alleyway and driveway entrances.

12. Grading of aggregate bases and aggregate sub-base shall be as follows: Aggregate materials shall have water added to them and shall be mixed and processed to produce a uniform blend of material before placement. After processing, the material shall be placed and spread on the prepared sub-grade and shall be placed in a uniform layer or layers not exceeding six (6") inches in compacted depth, unless otherwise approved in writing by the City Engineer. Each layer of aggregate base shall be compacted to a density of not less than 100% of the maximum density. The finished surface of the sub-grade shall not vary from the grades established by the City Engineer by more than: 0.04 of a foot above or below specified grade.

13. Compaction testing for sub-grade will be done after the sub-grade has been string lined and is within tolerance and accepted by the City Engineer. The City Engineer or his representative will direct the number and location of density tests. All sub-grades shall have a blue-top elevation set to finished grade and left and right edges of pavement, and centerline of roadway.

14. One (1) sand cone test shall be required for every ten (10) nuclear density tests performed, or when requested by the City Engineer or his representative. The City Engineer or Engineer's representative shall determine the locations of these sand cone tests.

15. All materials, including but not limited to aggregate base course, borrow material and native material, will be accepted in place only. Testing required for acceptance will include a sieve analysis and plasticity index, (P.I.). Determination of maximum theoretical density will be in accordance with ASTM D698. Only a four-point proctor test will be accepted.

16. The base course shall not be placed on sub-grade until the City Engineer has accepted the sub-grade. All materials will be accepted in place only.

17. Compaction densities: M.A.G. type I Backfill material (Section 601.4.4) is modified to include areas under the pavement, right-of-way, and easements for all trenches including sewer, water, electric, gas, telephone, and storm drains, moisture spec. 2.0 percent below optimum moisture compact to 95% of maximum theoretical density. All materials outside the moisture spec-limit shall be considered unsuitable, subject to removal and material shall be uniform.

18. The location of all sewer stub-outs shall be stamped on the top of vertical curb, and face of rolled curbs, with a four (4") inch high letters (IE: "S").

19. All curb, gutter and sidewalk expansion joint filler will be ½" bituminous pre-molded strips. All expansion joint spacing shall not exceed a maximum of (50') feet or as directed by the City Engineer. Concrete curing compound material shall be a white pigment membrane used on all concrete structures including curb & gutter, sidewalk, headwall, catch basins and sidewalk ramps.

20. Paving will not commence until aggregate base course compaction and gradation tests are completed and the City Engineer accepts the results.

21. USPS Cluster Mail Box locations must be pre-determined and noted on the civil plans for grading and paving. Add cluster boxes to the Legend and in Construction Notes. Cluster Box locations should be shown on the "Overall Sewer/Water/Hydrant/Streetlight Plan."

22. Median Curb & Gutter Bull Nose shall be painted yellow, with reflective glass beads, per M. A. G. DTL-223, and have yellow pavement reflectors installed after the painting is complete.

II. GRADING NOTES

1. Site area: _____ net acres.

2. Approved drainage report:
   BY: _____, DATED: _____, _____. JOB NUMBER: # _____.

3. Approved geo-technical report:
   BY: _____, DATED: _____, ____. JOB NUMBER: #_____.

4. The contractor is responsible for complying with all necessary regulations and requests by the City and Pinal County regarding dust control.

5. Removal of all cacti and native plants shall be in accordance with the provisions of the "Arizona Native Plant Law" A.R.S. Chapter 7.

6. Contractor must keep public streets clear of soil, mud, and debris at all times.

7. Contractor must prevent damage to drainage during grading construction.

8. Contractor must correct any damage to public or private property that results from work done under the approval of the Grading permit.

9. If site grading totals more than one-tenth (0.1) acre, Contractor must obtain a Pinal County Dust Control Permit. If grading exceeds one (1.0) acre, this activates AZPDES and Contractor must submit a NOI to ADEQ and prepare a Storm Water Management Plan acceptable to ADEQ.

10. All on-site grading must comply with Chapter 70 of the Uniform Building Code.

11. All grading in the public right-of-way must comply with M.A.G. Specifications and Standard Details; the engineer's approved plans and specifications for the project; and the soils engineer's geotechnical report for the project. Surveyors will set construction stations, stakes, establishing lines and grades for road work, curbs, gutters, sidewalks, structures and centerlines for utilities and necessary appurtenances as he may deem necessary, he will furnish the contractor with all necessary information relating to the grades. These stakes and marks shall constitute the field control by and in accordance with which the contractor shall establish other necessary controls and perform the work. The contractor shall be held responsible for the preservation of all stakes and marks, and if the contractor has carelessly or willfully destroyed the

construction stakes or marks, the cost for replacing them will be charged against him.

12. No minimum floor elevation shall be lowered unless approved by the City Engineer.

13. Any slope that is steeper than 3:1 shall be rip-rapped or shall be re-vegetated.

14. The contractor shall provide a level bottom (+/- 1/10) in all retention basins, at the elevations shown on the plans. Retention basin side slopes shall not exceed 4:1, unless approved by the City Engineer and noted on the plans.

15. Retention basin percolation tests shall be performed after grading is completed and prior to landscaping. Percolation tests shall be submitted to the City Engineer. Recommendations regarding number of drywells required to meet the requirements of the City Code will be presented to the City Engineer for approval, and the final number of drywells required shall be determined by these tests. Drywells require a permit from the Arizona Department of Environmental Quality and Arizona Department of Environmental Quality drywall registration numbers shall be noted on the as-built plans.

16. **GRADING PLAN AS-BUILTS:**

As-graded certification of the on-site grading by the design engineer is required prior to final acceptance of any on-site grading or drainage improvements.

As-built drawings of the public improvements by the design engineer is required prior to final acceptance of the public improvements.

As-built grading plans shall be prepared by the design Engineer after grading is completed. These shall include but not be limited to, as-built elevations for: finished pads, all rear property corners, top of curb at all property lines, retention basin bottoms, swales, berms and perimeter landscape easements, any and all deviations from the approved plans at the time of completion of mass grading. If any drywells have been installed, ADEQ drywall registration numbers must be made part of the as-built plans.

III. STORM SEWER NOTES

1. Cut-off walls with a minimum dimension of 1'-6", shall be used at all scuppers, and terminations of riprap and concrete storm drainage culverts and Concrete Spillway behind scuppers 6' minimum.

2. Guard railings shall be placed on all scuppers above spillways.

3. Trash racks are required at all inlets and outlets of storm sewer head walls for all pipes 12" (inches) in diameter and larger.

4. Reinforced concrete pipe (RCP) shall be placed per manufacturer's specifications and in accordance with M.A.G.

5. All riprap shall be grouted.

6. "U-type" headwalls with wing walls per M.A.G. STD, Det. 501-3 or 501-4 are required for all exposed storm water pipe.

7. Manhole concrete collar shall be 1' foot deep and 1' foot wide outside of rim casting. Collar shall be used in unpaved as well as paved areas.

8. Retention basins should be constructed with a two-foot (2') bench at top prior to start of slope.

9. All CMP and RCP pipe joints shall be joined with an "O" ring or gasket type watertight seal.

10. Any storm drains crossing the City streets that are going to be paved will be required to use 2-sack A.B.C. slurry fill to the top of the pipe with 6" to 8" on each side of pipe. All storm pipes within City ROW shall be RGRCP.

11. Construction of sewer and storm drain, 4" A.B.C. bedding per M.A.G. spec. 702. Modified compact to 95% typical.

12. Construct reinforced concrete Box Culverts shall be constructed per A.D.O.T. standards & specifications, typical.

13. ABC Bedding material of four (4") inches shall be used and compacted to 95% for all Storm Sewer Pipes.

14. Construction of manhole foundations for all Storm Sewer Bases shall be per M. A. G. Sections 505 and 725.

15. **STORM PLAN AS-BUILTS:** As-Built storm sewer plans prepared by the design engineer shall include, but not be limited to, the following: Top of

Curb (TOC) elevations at both ends of each scupper and gutter at center or flow-line of each scupper; inlet and outlet inverts; headwall top elevations and inverts; cross-pan and valley gutter flow lines elevations; storm manhole rim and invert elevations; drywell rim elevations; pipe dimensions and lengths, and any and all deviations from approved drawings.

IV. PAVING NOTES

1. All grading, excavation, paving, trenching, pipe bedding and backfill shall comply with the recommendations set forth in the Soils (Geo-Technical) Report for this project and the referenced required specifications and details. Soils Report and pavement design were prepared:
   BY: _____,
   JOB NO. _____, DATED: _____, _____

2. The contractor shall verify the locations, elevations and horizontal controls of all existing utilities at point of tie-in prior to commencing any new construction. Should any location, elevation or control differ from that shown on these plans, the contractor shall contact the owner's agent.

3. The contractor shall give 72 hours notice to the City Engineer prior to any construction activity within the right-of-way.

4. The City Engineer must approve all plan revisions in writing prior to construction of any changes to approved plans.

5. Upon commencement of work, traffic control devices shall be posted and maintained by the contractor until such time as work is completed.

6. Remove and relocation of all mailboxes, fences, signs, gates, posts pipes, etc., within the right-of-way and construction limits shall be directed by the City Engineer.

7. 25 MPH speed limit signs shall be located at all entrances into the development. 35 MPH signs for collectors shall be located per the plans.

8. Concrete Collars, on all utility and survey monument frame adjustments, are to be installed flush with the proposed or existing pavement.

9. Paint for pavement marking and striping shall be thermal traffic paint applied in a single coat at a rate of 100 to 110 sq. feet per gallon with traffic beads included.

10. Street cuts on asphalt pavement: Cut existing pavement at one (1') from the utility trench cut, per M.A.G. detail 200 type (T) top; tack edges (using A19mm per. MAG Sect.710 asphaltic concrete hot mix.). Asphalt concrete shall be tested for compaction, to 95%. The contractor, at his expense, will have a private lab core sample and run a Marshall for compaction test, for acceptance on all street cuts. All replacement pavements shall match existing, unless authorized in writing by the City Engineer.

11. All construction and test methods shall be in conformance with the City of Maricopa and Maricopa Association of Governments (M.A.G.) Uniform Standards Specifications and Details for Public Works Construction, latest edition.

12. Asphaltic concrete shall conform to M.A.G. USSD Section 710 mix specifications.

13. All concrete shall comply with M.A.G. Section 725, Class-A 3000-PSI compressive strength at 28 days, unless otherwise specified. Contractor shall supply mix design to the City Engineer for approval prior to placement. Contractor shall supply a copy of each batch ticket to the City Engineer or his representative.

14. A copy of the City approved plans must be kept on-site at all times, during the course of construction.

15. All newly constructed pavements shall receive an application of sealant (fog-seal), approved in advance by the City Engineer and prior to acceptance into a warranty period. Hydrant reflectors shall be installed after the application of the sealant.

16. In the event of any dispute between these plans and M.A.G. standard specifications, these approved plans shall prevail.

17. The contractor/owner is responsible for final adjustment of all manholes, valves, clean-outs, water meter boxes, j-boxes, etc., and restoration of construction site to M.A.G. standards, including right-of-way grading.

18. Engineer's testing of A/C mix prior to placement is required and results are to be delivered to the City Engineer or his representative prior to paving.

19. Rolling patterns required by the geo-technical testing firm shall also be supplied to the Engineer's representative.

20. Core testing of newly constructed asphalt concrete surfaces may be required at the discretion of the City Engineer. Core tests are mandatory, along with supporting Marshall test results, for all existing roadways where street cuts are necessary.

21. Protection of valley gutters, cross-pans and aprons during paving operations shall be the responsibility of the contractor and all damaged concrete shall be replaced prior to acceptance.

22. Tack seal shall be required between lifts, all vertical concrete surfaces prior to placement of asphalt. This requirement also applies to vertical asphaltic concrete surfaces and at all joints of new lifts.

23. The surveyor shall perform installation and straddling of monuments. Once stamped, datum shall be part of the as-built plans.

24. Street sign bases, poles and signs shall be installed prior to the final walk-through and acceptance into any warranty period. Only channel sign posts shall be permitted.

25. All Warning, Regulatory and Street Name Signs must be manufactured of "ASTM D-4956-01a-Type IX Sheeting". All other signs must be manufactured with "ASTM D-4956-01a-Type III Sheeting" which will be attached to the standard sign aluminum plates. Sign imaging shall be in compliance with the reflective sheeting manufacturer's matched component system. Sign imaging shall consist of an acrylic based electronic cut able film 3M 1170 Series or equivalent or silk-screened (depending on the quality of signage) with standard highway colors. In addition, if called out on plans, to create a graffiti-protective coating, a premium protective overlay film, 3M 1160 or equivalent, shall be used which is designed to comply with the underlying reflective sheeting match component system.

26. Right-of-way grading shall be completed prior to the final walk-through and shall be held one (1") inch below back of walk. (B.O.W.)

27. Paving As-Builts: Paving as-built plans shall be prepared by the design engineer and shall certify that this project was constructed in substantial conformance with the approved plans prior to request for final inspection, certificate of occupancy or release of assurance.

28. Freshly paved finished roadway shall be 1/4 "above the lip of the concrete gutter". Pavers shall be equipped with an activated screed in order to make a first pass (ribbon) of 17' or greater.

29. Sub-grade preparation for all sidewalks, curb and gutter shall be scarified and loosened to a depth of 6", and shall be constructed to achieve a uniform moisture by the addition of water, moisture shall be maintained 2.0 percent above optimum moisture prior to placement of concrete, and compacted to 95 percent of maximum density. All materials outside the moisture limit shall be considered subject to removal.

30. Any Pavement adjacent to existing right-of-way must match the existing pavement design, unless authorized, in writing, by the City Engineer.

31. Finished grade of compacted, freshly placed asphalt, shall be no more or no less than ¼" inch above the lip of the gutter.

32. No diesel, or other cleaning solvents, will be applied to the paving hopper, the screed, or the auger immediately prior to beginning of the paving operation.

33. **PAVING PLAN AS-BUILTS:** As-Built plans shall include, but not be limited to, the following: Horizontal and Vertical control, changes to any grade break locations, Top of Curb (TOC) elevations at each curb return, property corner, gutter/flow line elevations, scupper and catch basin inverts, monumentation, cross slopes, valley gutter flow line elevations, hydrant reflectors and any and all changes to the approved plans.